

Notice of Allowability

Application No.

10/750,845

Applicant(s)

KANG ET AL.

Examiner

Art Unit

John S. Chu

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 11/28/07.
2. ☒ The allowed claim(s) is/are 11-14 and 17-21.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

John S. Chu
Primary Examiner
Art Unit: 1795

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance: The claimed invention is drawn to the following:

11. (Previously presented) A method for forming a photoresist pattern on a large-scale substrate, comprising:

applying a photoresist composition to the large-scale substrate with a multi-micro nozzle (MMN) head coater,

drying the photoresist composition applied to the large-scale substrate to prepare a photoresist film;

placing a patterned mask over the photoresist film and substrate and exposing the photoresist film to light; and

developing the exposed photoresist film to obtain a photoresist pattern;

wherein the photoresist composition comprises:

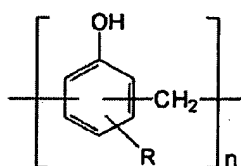
(a) 5 wt% to 30 wt% of a polymer resin represented by the following Chemical Formula 1;

(b) 2 wt% to 10 wt% of a diazide photoactive compound;

(c) 50 wt% to 90 wt% of an organic solvent; and

(d) 500 to 4000 ppm of a Si based surfactant:

Chemical Formula 1



wherein R is C₁ to C₄ alkyl, and n is an integer of 15 to 10,000, and wherein the Si-based surfactant is a polyoxyalkylene dimethylpolysiloxane copolymer compound,

wherein the composition and content of solvent and surfactant is controlled to prevent stains and improve coating characteristics in a photoresist film formed on the substrate from the photoresist composition, and

wherein stains include central stains, lateral stains, or cloudy stains.

21. (Previously Presented) A method to prevent stains in a photoresist film applied to a large-scale substrate by a multi-micro nozzle (MMN) head coater, comprising

applying a photoresist composition to the large-scale substrate with the MMN head coater by spray-dispense coating and spinning, wherein the photoresist composition comprises:

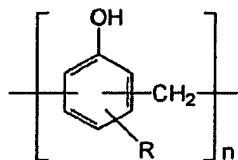
(a) 5 wt% to 30 wt% of a polymer resin represented by the following Chemical Formula 1;

(b) 2 wt% to 10 wt% of a diazide photoactive compound;

(c) 50 wt% to 90 wt% of an organic solvent; and

(d) 500 to 4000 ppm of a Si based surfactant:

Chemical Formula 1



wherein R is C₁ to C₄ alkyl, and n is an integer of 15 to 10,000,

wherein the Si-based surfactant is a polyoxyalkylene dimethylpolysiloxane copolymer compound, the organic solvent is a mixture of 50 wt% to 90 wt% of propyleneglycol methyl ether acetate (PGMEA) and 10 wt% to 50 wt% of ethyl-3-ethoxypropionate (EEP), and the composition and content of solvent and surfactant is controlled to prevent stains and improve coating characteristics in the photoresist film

formed on the substrate from the photoresist composition, and

wherein stains include central stains, lateral stains, or cloudy stains.

Applicants have cancelled claims 22 and 23 drawn to a product-by-process and a photoresist composition. The only rejection outstanding was over JEFFRIES, III et al or EBERSOLE in view of KODAMA et al, SHERIFF et al, and GRACIA et al. By cancellation of the only claims rejected, and claims 11-14, and 17-21 drawn to the method indicated be allowable over the prior art references of record, claims 1—14, and 17-21 are seen as allowable and passed to issue.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Chu whose telephone number is (571) 272-1329. The examiner can normally be reached on Monday - Friday from 9:30 am to 6:00 pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Cynthia Kelly, can be reached on (571) 272-1526

The fax phone number for the USPTO is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PMR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/John S. Chu/
Primary Examiner, Group 1700

J.Chu
December 12, 2007